DOT SUMMARY

1996 RADIONAVIGATION USER CONFERENCES

The U.S. Department of Transportation publishes the biennial Federal Radionavigation Plan (FRP) in conjunction with the Department of Defense. FRP User Conferences are held every two years, prior to preparation of the latest edition of the FRP. The User Conferences are open meetings at which Federal agency representatives discuss current plans and policies for Federally-provided radionavigation systems. The audience is invited to ask questions, provide comments, and voice concerns. The target audience for the conferences is quite large, including individual users, user associations, and publications with an interest in radionavigation systems and their applications for air, land, marine, and space; Federal, state, and local government agencies; academic institutions; and equipment manufacturers and service providers. Applications are not limited to navigation, but cover all uses of radionavigation systems, including timing, positioning, geodesy and surveying, and weather research. The conferences are open to all, free of charge.

Two conferences were held this year: in Cambridge, MA on February 6, 1996 (attended by about 85); and in Boulder, CO on February 15, 1996 (attended by about 75). Many individuals attending the conferences had questions, concerns, or comments on Federal radionavigation system policy. For the benefit of those users, as well as for those unable to attend, the following sections summarize the comments and responses.

There was a general concern with the process of developing the FRP. There were concerns with the credibility of the FRP; the perceived lack of a carefully planned radionavigation system mix; and how decisions are made for U.S. radionavigation policy. In addition, there were many questions on what happens with the user input provided at the conferences. A major cause for these concerns is the significant change in policy between the 1992 and 1994 FRPs on termination dates for Loran-C (from the year 2015 to the year 2000) and Omega (from the year 2005 to September 30, 1997).

Every two years, the FRP provides the current U.S. government plans and policies for Federally-funded radionavigation systems. It can be viewed as a “biennial snapshot” that provides the best system projections available at the time of publication. The goal is to strive to maintain a reasonable degree of stability and continuity, but the dynamics of politics, rapid technological innovation and change, market forces, and budget realities are significant drivers of FRP policy.

The U.S. Federal Radionavigation Plan is developed by a team of representatives from civil and defense Federal government organizations responsible for providing common-use (civil and military) radionavigation systems. The agencies are responsible for providing Federally-funded systems and services in accordance with their statutory responsibilities;

monitoring and coordinating the needs of their users; developing budget priorities; and operating systems within the constraints of their budgets.

Past versions of the FRP called for a 10-15 year transition period for phaseout of radionavigation systems. For the 1994 FRP, it was recognized that budget realities, the increasingly rapid rate of technological change, and user demand for new systems made that lengthy transition period unreasonable. A suitable transition period in today's environment may be much shorter. The FRP process now considers the primary criteria to be the rate of user equipage; the public interest; and budgetary constraints. One of the primary functions of the FRP is to alert users to potential policy changes.

The FRP must strike a balance among the many diverse, sometimes competing, needs and desires of the users. This is particularly difficult in a constrained budget environment, when the emphasis must be on provision of basic services required for safety of navigation. For example, some users feel that the U.S. is not moving quickly enough and has been too conservative in implementing GPS and replacing ground-based systems; others distrust reliance on a single system and want to maintain existing ground-based navaids in addition to GPS.

The 1996 FRP will represent a re-evaluation of government policy at the time of publication, taking into account the need for continuity and stability in concert with budget realities and priorities, to guide the U.S. as well as the international community. It will provide a more realistic consideration of needs, requirements, and budgets.

In the past, input and concerns from users have always been relayed to the decision-making level of the operating agencies. On March 18, 1996, the specific user concerns on Loran-C and Omega from this year's user conferences were briefed to the DOT POS/NAV Executive Committee, which includes senior-level officials of the operating civil agencies.

Courses of action for greater user involvement include formal announcements in the Federal Register, with a comment period, on system termination (as stated in the 1994 FRP). In addition, a greater number of open forums, perhaps conducted by the operating agencies for representatives of user groups, could be held.

There were several complaints about the late publication of the last Federal Radionavigation Plan (the 1994 FRP was published in April 1995).

Publication of the 1994 FRP was delayed due to delay in the FAA Capital Investment Plan and the need to coordinate language between DOT and DOD on GPS augmentations and TACAN. While a specific publication date cannot be guaranteed, every effort will be made to publish the next FRP by December 1996.

What is the status of the Loran-C plan requested by Congress, and how is it being developed?

The Loran-C plan requested by Congress is currently being coordinated within FAA.

Many non-maritime users of Loran-C want to continue system operation after the year 2000 termination date stated in the latest edition of the FRP. Loran-C is used by many general aviation pilots, and is viewed as a safe, proven, reliable, and cost-effective backup to GPS by its proponents.

The decision to phase out operation of Loran-C in the year 2000, rather than the year 2015 as stated in the 1992 FRP, was based primarily on budget considerations in light of rapidly maturing GPS technology and decreasing prices for GPS equipment. The USCG DGPS system, commissioned in 1996, will meet the navigation needs of U.S. users in coastal and harbor/harbor approach areas. GPS currently meets the needs for a supplemental aid to navigation in the NAS; by the year 2000, aviation needs for en-route navigation and non-precision approach will be fully met by the GPS Wide-Area Augmentation System. However, as stated in the 1994 FRP, continued operation after the year 2000 could be justified if requirements for Loran-C are validated.

Many users of Omega wish to continue operation of the system beyond the September 30, 1997 termination date stated in the 1994 FRP. Current users of Omega are primarily weather researchers. The concern is that it will take a longer period to transition to the use of GPS in weather research, resulting in several years of degraded weather data. There is still some aviation use of Omega and concern with aircraft downtime to equip with GPS.

DOT took an action item from the users conferences to re-visit the time frame for Omega phase-out. The concerns of Omega meteorological users were briefed to the DOT POS/NAV Executive Committee on March 18, 1996. DOT, in concert with the meteorological community, is currently reviewing requirements for Omega and options for continued funding. The Omega situation must be resolved well before September 1996 for the USCG to proceed with negotiations with the Omega partner nations. Currently, Omega is no longer in the USCG budget and is not in the FAA budget for 1998. There is no aviation navigation requirement for Omega beyond the proposed 1997 termination date. However, the FAA will participate with DOT in reviewing the Omega situation relative to weather service operations.

AOPA, representing general aviation, wants a reasonable mix of cost effective technology for general aviation; it supports the concept of sole-means navigation, but needs assurance that safety will not be compromised and that access to the NAS will be assured during the system transition period. They are concerned about sole reliance on GPS without availability of GA-affordable avionics or a history of GPS operational performance and reliability.

The Federal Aviation Administration assures the user community that there will be no reduction in safety. The transition policy includes operational experience, safety, and

ranking of systems that show net economic benefit. Ground-based systems will be sustained until GPS meets all user requirements. There will be no compromise of safety in the transition to satellite-based systems. If complementary technologies are needed to meet the availability of the navigation signal requirement, they will be in place. The active participation of the user community is required, especially in the current tight budget situation.

Several aviation user groups were concerned that there was no meeting located in Washington, D.C., and requested that consideration be given to a Washington, D.C. site for the next cycle.

A meeting will be held in the Washington, D.C. area during the next user conference cycle.

There is a general concern for relying on signals from a single satellite system for navigation as well as for timing for the nation's communications and power infrastructure. There was much concern with intentional and unintentional interference to GPS; multipath on the received GPS signal; and possible deleterious impacts on the GPS signal during solar maximum periods. These issues will become critical if GPS is the only provided system and all users are using the same frequency. Does the panel have any concerns on this, and how are they being addressed?

Studies on interference, both intentional and nonintentional, are ongoing within the FAA and OST/P-7. The FAA is conducting experiments and studies to ensure that service can be maintained and the safety requirement can be sustained. The FAA is also investigating impacts of the more severe radiation environment that accompanies the solar cycle maximum. Initial results indicate that there will be no significant impact on the system. Based on experience and lessons learned during the last solar maximum, most single-channel receivers should be able to handle deviations caused by the solar cycle.

A second civil frequency (L5) would add greatly to the robustness of the system.

On the issue of multipath on the received GPS signal, there are ways of dealing with it in the commercial sector for user equipment.

Those with concerns in the areas of interference/solar maximum can contact Hank Skalski of the OST/P-7 staff at (719) 554-2570.

GPS use for automatic dependent surveillance should be addressed in the FRP.

This point will be considered in preparation of the 1996 FRP.

The additional civil frequency (L5) option is desired by the meteorological community.

Civil use must justify the cost of adding the L5 frequency. OST/P-7 is currently conducting a cost/benefit study of adding the L5 frequency to the Block IIF GPS satellite

procurement. A decision to proceed with this option should be made no later than mid-May 1996. Parties interested in contributing to the L5 cost-benefit analysis can contact Ken Lamm of the OST/P-7 staff at (202) 366-6716.

A fundamental issue is the lack of consistent maps and charts worldwide that are based on the same datum as GPS (WGS 84). What is the timetable for the agencies to revise aeronautical and maritime charts to be compatible with the GPS datum? Is there a plan and a schedule to move to WGS 84? This issue should be addressed in the FRP.

The FRP, in both the 1992 and the 1994 editions, addressed the issue of GPS and the evolution of charts and datums in a technical appendix. The FRP will continue to address this issue and will provide updated information in the 1996 edition.

The USCG datum for USCG differential network is NAD 83. For purposes of navigation, mapping, and charting, NAD 83 and WGS 84 are effectively equivalent (they differ by no more than a few meters).

ICAO has adopted WGS 84 and the target date for conversion is 1998.

Given the need for very precise accuracies required for some types of surveying, what is the policy on the DOD-imposed 48-hour delay on provision of precise ephemerides?

At the present time, the 48-hour delay will be maintained.

The U.S. needs to state a clear policy on GPS.

The Presidential Decision Directive (PDD), released on March 29, 1996, provides clear guidance on GPS policy. The text of the policy is available on the USCG Navigation Center's internet web site. The PDD's policy guidance will be incorporated into the 1996 FRP.

The Department of Transportation, Federal Aviation Administration, et al should support universal standards for commercially available equipment. This will make it easier and more-cost effective for users in the field to equip.

A single standard that can meet the base needs of different categories of users can allow costs to go down considerably. Although some requirements are and will remain unique, use of universal standards can be encouraged, where applicable, to meet multiple requirements.

Focused round-table discussions with user groups (aviation, marine, etc.) on radionavigation system plans and policy would be valuable, in addition to the larger user conferences.

The Department of Transportation supports this idea and would be willing to host these discussions. Please contact the Chairman, DOT POS/NAV Working Group (contact information is given at the end of this document).

The FRP should be more international in scope.

The FRP can be viewed as a current description of how U.S. taxpayers are going to have their tax dollars spent on radionavigation systems. Polices in the FRP should encourage and promote the U.S. markets overseas. We are heading toward global systems and the U.S. must preserve and enhance its market share while taking the leadership role in ensuring that GPS is accepted internationally as a basic building block of GNSS. The FRP must also acknowledge and support any international agreements and commitments on radionavigation systems that the U.S. is party to. In the past, the FRP has always acknowledged the efforts and resolutions of international organizations such as ICAO, IMO, and IALA, and will continue to do so in future editions.

The FRP has much credibility internationally and others (i.e., the Europeans) are using it as a model to develop their own plan. The Federal Radionavigation Plan plays a very important role in the international community, and the Federal government needs to remain sensitive to this by acknowledging the efforts of other countries and striving to maintain a cohesive policy. A significant move toward this goal is the recently-released Presidential Decision Directive on GPS that clarifies the U.S. position on international use of GPS and establishes a mechanism, with the State Department, for development of international agreements.

For further questions and comments, please write to:

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